

We claim:

substantiation

1. A method for creating a tissue seal, comprising:
identifying a tissue in need of repair;
contacting the tissue, and optionally a second tissue, with at least one photosensitizer agent to form a tissue-photosensitizer mixture; and
applying electromagnetic energy to the tissue-photosensitizer mixture in a manner effective to produce cross linking of a protein in the tissue,
wherein the tissue is not contacted with an exogenous protein or peptide which is cross linked by the application of electromagnetic energy,
thereby creating a tissue seal.

2. The method of claim 1, wherein the tissue is corneal tissue.

3. The method of claim 1, wherein the at least one photosensitizer agent is selected from the group consisting of Rose Bengal, riboflavin-5-phosphate, and N-hydroxypyridine-2-(1H)-thione.

4. The method of claim 1, wherein the at least one photosensitizer agent is Rose Bengal.

5. The method of claim 1, wherein the contacting step occurs *ex vivo*.

6. The method of claim 1, wherein the contacting step occurs *in vivo* in a subject.

7. The method of claim 6, wherein the subject is a human.

8. The method of claim 1, wherein the application of electromagnetic energy to the tissue-photosensitizer mixture occurs without substantial thermal tissue damage.

9. The method of claim 1, wherein the application of electromagnetic energy to the tissue-photosensitizer mixture occurs without more than a 3°C rise in temperature.

10. The method of claim 1, wherein the application of electromagnetic energy to the tissue-photosensitizer mixture occurs without more than a 2°C rise in temperature.

11. The method of claim 1, wherein the application of electromagnetic energy to the tissue-photosensitizer mixture occurs without more than a 1°C rise in temperature.

sub a3
12. A method for repairing a corneal lesion, comprising:

contacting a corneal tissue with at least one photosensitizer agent to form a corneal tissue-photosensitizer mixture; and

applying electromagnetic energy to the corneal tissue-photosensitizer mixture in a manner effective to elicit the production of a reactive species from the photosensitizer,

wherein the corneal tissue is not contacted with an exogenous protein or peptide which is cross-linked by the application of electromagnetic energy,

thereby promoting a partial or complete repair of the corneal lesion.

13. The method of claim 12, wherein the corneal lesion is caused by a surgical procedure.

14. The method of claim 13, wherein the surgical procedure is selected from the group consisting of corneal transplant surgery, cataract surgery, laser surgery, keratoplasty, LASIK, refractive surgery, cornea reshaping, and treatment of corneal laceration.

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15. The method of claim 12, wherein the electromagnetic energy applied is greater than 200 J/cm².

16. The method of claim 12, wherein the electromagnetic energy is applied at an irradiance less than 3.5 W/cm².

17. A method for repairing a corneal lesion *in vivo* in a living subject, comprising:
contacting a corneal tissue with Rose Bengal (RB) to form a corneal tissue-RB mixture; and
applying electromagnetic energy to the corneal tissue-RB mixture in a manner effective to elicit the production of a reactive oxygen species from the RB, wherein the corneal tissue is not contacted with an exogenous protein or peptide which is cross-linked by the application of electromagnetic energy, thereby promoting a partial or complete repair of the corneal lesion.

18. The method of claim 17, wherein the subject is a human.

19. The method of claim 17, wherein the corneal lesion is caused by a surgical procedure.

20. The method of claim 19, wherein the surgical procedure is selected from the group consisting of corneal transplant surgery, cataract surgery, laser surgery, keratoplasty, LASIK, refractive surgery, cornea reshaping, and treatment of corneal laceration.

21. A kit for repairing a corneal lesion comprising:

a photosensitizer agent; and
instructions for photoactivation of the photosensitizer agent to repair a corneal lesion.

22. The kit of claim 21, wherein the photosensitizer agent is Rose Bengal.